

Application No.: 10/028,482

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended). A system for high throughput detection of genotypes comprising:

a sample preparation method comprising a method for amplifying a plurality of regions of interest to form amplicons and a method for pooling aliquots of a plurality of the amplicons into a plurality of pooled samples for hybridization;

a sample preparation automation system;

a sample tracking system;

an automated high density probe array loader comprising a robotic arm and a refrigerated unit;

a plurality of high density nucleic acid probe arrays wherein each array comprises about 400,000 different sequence probes, wherein each probe is present in a different feature of the array;

a computer system for managing hybridization data and for analyzing hybridization data to determine the genotype of a sample at a plurality of single nucleotide polymorphisms in a region of interest, wherein said hybridization data is obtained by hybridizing a pooled sample to a high density nucleic acid probe array ~~make~~ genotype calls.

Claim 2 (previously presented). The system of claim 1 wherein the sample preparation automation system is a robotic device for handling multiwell plates.

Claim 3 (original). The system of claim 1 wherein the sample tracking system is a bar code system.

Claim 4 (currently amended). The system of Claim 1 wherein the computer system comprises a processor; and a memory being coupled with the processor, the memory

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storing a plurality of machine instructions that cause the processor to perform the ~~method~~ step of analyzing the hybridization data to determine the genotype of a sample at a plurality of single nucleotide positions in a region of interest.

Claims 5-14 (canceled).

Claim 15 (currently amended). The system of claim 1 wherein two laboratory personnel working for one 8 hour work day can obtain genotype calls for at least 1.4 megabases of sequence.

Claim 16 (currently amended). The system of claim 1 wherein two laboratory personnel genotype about 30 kilobases ~~at least 35 kilobases~~ of sequence from each of at least 40 samples in one 8 hour work day.

Claim 17 (previously presented). The system of claim 1 wherein the sample tracking system and the computer system are linked.

Claim 18 (currently amended). The system of claim 1 wherein the ~~sample preparation~~ method for amplifying a plurality of regions of interest comprises long range PCR polymerase chain reaction of a plurality of nucleic acid samples.

Claim 19 (currently amended). The system of claim 18 wherein the amplicons obtained after long range PCR polymerase chain reaction amplification are from 3 to 15 kilobases.

Claim 20 (currently amended). The system of claim 18 wherein prior to long range PCR polymerase chain reaction amplification each nucleic acid sample is reverse transcribed to obtain cDNA.

Claim 21 (currently amended). The system of claim 1 ~~wherein hybridization data is obtained by hybridizing nucleic acid samples to high density nucleic acid probe arrays~~ wherein said probe arrays have feature sizes of about 20 x 24 microns or smaller.

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Claim 22 (currently amended). The system of claim 21 wherein each high density nucleic acid probe array is capable of simultaneous screening of ~~at least~~ about 30 kilobases of sense nucleic acid sequence and ~~at least~~ about 30 ~~kb~~ kilobases of antisense nucleic acid sequence.

Claim 23 (currently amended). The system of claim ~~21~~ 1 wherein the high density nucleic acid probe arrays are resequencing or variation detection arrays.

Claim 24 (currently amended). The system of claim ~~21~~ 1 wherein the high density nucleic acid probe arrays genotype a plurality of single nucleotide polymorphisms.

Claim 25 (currently amended). The system of claim ~~21~~ 1 wherein a contiguous sequence is tiled on the high density nucleic acid probe arrays.

Claim 26 (previously presented). The system of claim 1 wherein the sample tracking system comprises a single or multiple dimensional barcode system.

Claim 27 (previously presented). The system of claim 1 wherein the sample tracking system comprises an electromagnetic encoding system.